

What is claimed is:

- 1 1. A mixer/flow conditioner comprising:
2 at least three successive partitions defining at least two gaps therebetween;
3 means within each gap defining a plurality of passages, at least one passage in
4 each gap being oriented to impart a tangential velocity component to a
5 packet passing therethrough; and wherein
6 the at least one passages cooperate to convert an initial flow stream into a final
7 flow stream having a swirl number less than about 0.2.
- 1 2. The mixer/flow conditioner of claim 1 wherein the means within each gap for
2 defining a plurality of passages is a corrugated strip.
- 1 3. The mixer/flow conditioner of claim 1 wherein the swirl number is less than
2 about 0.03.
- 1 4. The mixer/flow conditioner of claim 3 wherein the swirl number is less than
2 about 0.02.
- 1 5. The mixer/flow conditioner of claim 1 wherein the plurality of passages each
2 have an exit defining a hydraulic diameter and a length and the passages
3 within an individual gap have an equal length to hydraulic diameter ratio.
- 1 6. The mixer/flow conditioner of claim 5 wherein the passages in adjacent gaps
2 have orientations that are opposite each other whereby the passages in one gap
3 impart a clockwise swirl and the passages in the other gap impart a counter-
4 clockwise swirl.
- 1 7. The mixer/flow conditioner of claim 5 wherein the orientation of the passages
2 within an individual gap are identical.

- ✓ 8. The mixer/flow conditioner of claim 7 wherein the passages in adjacent gaps have orientations that are opposite each other whereby the passages in one gap impart a clockwise swirl and the passages in the other gap impart a counter-clockwise swirl.
- ✓ 9. The mixer/flow conditioner of claim 5 wherein all the passages have an orientation.
- ✓ 10. The mixer/flow conditioner of claim 1 wherein the partitions are approximately concentric.
- ✓ 11. The mixer/flow conditioner of claim 10 wherein there are at least 6 gaps.
- ✓ 12. The mixer/flow conditioner of claim 10 wherein adjacent gaps act as pairs.
- ✓ 13. The mixer/flow conditioner of claim 1 wherein the orientation of the passages is less than about 80 degrees relative to the central axis. ^{MA}
- ✓ 14. The mixer/flow conditioner of claim 13 wherein the orientation of the passages in two adjacent gaps defines an included angle between 15 and 60 degrees. *L see clm 28*
- ✓ 15. The mixer/flow conditioner of claim 13 wherein the passage has a length and an exit defining a hydraulic diameter, and the passages having a length to hydraulic diameter ratio less than about 10. *which*
16. The mixer/flow conditioner of claim 15 wherein the length to hydraulic diameter ratio is greater than about 0.5.
17. The mixer/flow conditioner of claim 1 further comprising an outer gap having means for defining channels wherein the channels have an orientation that generally only has an x component. *not defined*

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1 18. A mixer/flow conditioner for conditioning comprising:
2 at least two partitions defining a gap;
3 at least two corrugated strips positioned in the gap, each strip defining a
4 ^{enabled?} plurality of passages, each passage having an orientation; and wherein
5 the passages cooperating to produce a swirl number less than 0.2.

1 19. The mixer/flow conditioner of claim 18 wherein the swirl number is less than
2 0.03.

1 20. The mixer flow conditioner of claim 19 wherein the swirl number is less than
2 0.02.

1 21. The mixer/flow conditioner of claim 18 wherein the plurality of passages each
2 have an exit defining a hydraulic diameter and a length and the passages
3 within an individual gap have an equal length to hydraulic diameter ratio. *MA*

1 22. The mixer/flow conditioner of claim 21 the passages in adjacent gaps have
2 orientations that are opposite each other whereby the passages in one gap
3 impart a clockwise swirl and the passages in the other gap impart a counter-
4 clockwise swirl.

1 23. The mixer/flow conditioner of claim 22 wherein the gaps are concentric. *MA*

1 24. The mixer/flow conditioner of claim 23 wherein the gaps act in pairs. *MA*

1 25. The mixer/flow conditioner of claim 24 wherein the orientation of adjacent
2 gaps is opposite one to the other and the sum of the angular momenta of the
3 packets exiting the passages of adjacent gaps are equal to about zero. *MA*

1 26. The mixer/flow conditioner of claim 25 wherein there are at least 6 gaps.

1 27. The mixer/flow conditioner of claim 18 wherein the orientation is less than
2 about 80 degrees relative to the central axis. *MA*

- 1 28. The mixer/flow conditioner of claim 27 wherein the orientation of two
2 adjacent gaps defines an included angle between 15 and 60 degrees.
 ^{hand defined} ^{un}
- 1 29. The mixer/flow conditioner of claim 27 wherein each passage has an exit
2 defining a hydraulic diameter and a length, and the length to hydraulic
3 diameter ratio is less than 10.
- 1 30. The mixer/flow conditioner of claim 29 wherein the length to diameter ratio is
2 greater than 0.5.
- 1 31. The mixer/flow conditioner of claim 30 wherein the orientation of the
2 passages within a gap are identical.
- 1 32. The mixer/flow conditioner of claim 18 further comprising an outer gap
2 having means for defining channels wherein the channels have an orientation
3 that generally only has an x component.

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2 ^{indef - x not defined}